This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims:</u>

1. (Currently Amended) A method for optimizing a database query, the database query including criteria that references a plurality of tables in order to re-order a result set generated for the database query, <u>wherein the criteria is one of a GROUP BY clause and an ORDER BY clause,</u> the method comprising the steps of:

      applying transitive closure analysis to <u>at least one search condition in</u> the query <u>to identify an equivalent field for a field referenced in the criteria</u>; and

      based on the transitive closure analysis, rewriting the criteria to generate modified criteria to reduce the number of tables referenced thereby <u>by substituting the equivalent field for the field referenced in the criteria, including rewriting the criteria to generate modified criteria that references only one table, based on the transitive closure analysis</u>.

2. (Canceled).

3. (Previously Presented) The method according to claim 1, further comprising the step of:

      determining if the criteria references a first field from a first table and a second field from a second table.

4. (Currently Amended) The method according to claim 3, wherein the rewriting step comprises the step of:

      rewriting the criteria to reference the first field and a third field from the first table<u>, wherein a first search condition in the query searches on a match between the first field and the second field, and a second search condition in the query searches on a match between the second field and the third field, and</u>

wherein applying transitive closure analysis includes determining that the third field is equivalent to the second field in the criteria.

5. (Original) The method according to claim 1, further comprising the step of:

    determining if the criteria references a plurality of tables.

6. (Canceled).

7. (Currently Amended) The method of claim 1 6, further comprising the step of:

    building an index over a column of the one table.

8. (Previously Presented) The method of claim 1, further comprising the step of:

    building an index over more than one column of a table among the plurality of tables.

9. (Original) The method according to claim 1, wherein the database query involves a plurality of join operations and the method further comprises the step of:

    running the query according to a join order that is based on the modified criteria.

10. (Currently Amended) A method of optimizing a database query, the database query including criteria that operates to re-order a result set of the database query and requires creating a temporary file during operation, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause, the method comprising the steps of:

    applying transitive closure analysis to at least one search condition in the query to identify an equivalent field for a field referenced in the criteria; and

    rewriting the criteria, based on the transitive closure analysis, to generate a modified criteria by substituting the equivalent field for the field referenced in the criteria, wherein the criteria references a plurality of tables and the modified

criteria references a single table; said modified criteria operating to re-order a result set of the database query and avoid creating a temporary file during operation.

11.-12. (Canceled).

13. (Currently Amended) A method for optimizing a database query, the database query involving a plurality of join operations and a plurality of search conditions, the method comprising the steps of:

applying transitive closure analysis to the plurality of search conditions in the query to determine a subset of equivalent search fields; and

rewriting a criteria, that operates to re-order a result set of the database query, to generate a set of respective modified criteria that each reference one or more equivalent search fields, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause; and

selecting a join order from among a plurality of join orders for the plurality of join operations, including analyzing join orders using at least one of the set of respective modified criteria.

14. (Canceled).

15. (Previously Presented) The method according to claim 13, further comprising the step of:

running the query according to a join order, the join order determined by selecting one of the set of respective modified criteria.

16. (Original) The method according to claim 13, further comprising the step of:

identifying a subset of the respective modified criteria that reference a single, respective table and for which an index to that table exists.

17. (Original) The method according to claim 13, further comprising the step of:

identifying a subset of the respective modified criteria that reference a single, respective table and for which an index is to be created.

18. (Currently Amended) The method according to claim 17 ~~13~~, further comprising the step of:

running the query according to a join order, the join order determined by selecting one of the subset of respective modified criteria.

19. (Original) The method according to claim 13, further comprising the steps of:

performing cost analysis on each of the set of respective modified criteria; and

running the query according to a join order, the join order determined based on the cost analysis.

20. (Currently Amended) A program product, comprising:

program code configured upon execution thereof to:

apply transitive closure analysis to <u>at least one search condition in</u> a query that includes criteria that references a plurality of tables in order to re-order a result set generated for the query, and based on the transitive closure analysis, rewrite the criteria to generate modified criteria to reduce the number of tables referenced thereby<u>, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause, wherein the program code is configured to apply transitive closure analysis to identify from the at least one search condition an equivalent field for a field referenced in the criteria, and wherein the program code is configured to rewrite the criteria by substituting the equivalent field for the field referenced in the criteria;</u> and

a ~~recordable~~ physical, computer readable <u>storage</u> ~~signal bearing~~ medium bearing the program code.

21. (Original) The program product of claim 20, wherein the program code is further configured to:

run the query according to a join order that is based on the modified criteria.

22. (Currently Amended) A program product, comprising:

program code configured upon execution to:

apply transitive closure analysis to a plurality of search conditions to determine a subset of equivalent search fields within a database query involving a plurality of join operations and the plurality of search conditions, ~~and~~ rewrite a criteria, that operates to re-order a result set of the database query, to generate a set of respective modified criteria that each reference one or more equivalent search fields<u>, and select a join order from among a plurality of join orders for the plurality of join operations by analyzing join orders using at least one of the set of respective modified criteria, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause</u>; and

a <u>recordable</u> physical, computer readable <u>storage</u> ~~signal bearing~~ medium bearing the program code.

23. (Original) The program product of claim 22 further configured to:

run the database query according to a join order, the join ordered determined by selecting one of the set of respective modified criteria.

24. (Currently Amended) An apparatus, comprising:

at least one processor;

a memory coupled with the at least one processor; and

a program code residing in memory and executed by the at least one processor, the program code configured to apply transitive closure analysis to at least one search condition in a query that includes criteria that references a plurality of tables in order to re-order a result set generated for the query, and based on the transitive closure analysis, rewrite the criteria to generate modified criteria to reduce the number of tables referenced thereby, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause, wherein the program code is configured to apply transitive closure analysis to identify from the at least one search condition an equivalent field for a field referenced in the criteria, and wherein the program code is configured to rewrite the criteria by substituting the equivalent field for the field referenced in the criteria.